

MISCELLANEOUS NOTES (CHIEFLY TAXONOMIC) ON
EUCALYPTUS. ii.

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1. *E. SALIGNA* Sm., and *E. BOTRYOIDES* Sm. (*E. botryoides* Sm.
= *E. saligna* Sm. var. *botryoides*, var.nov.).

I propose to show that the above two species are conspecific. Their affinity long ago impressed me. In 1889* I wrote, "In external appearance and timber it (*E. botryoides*) seems to merge into *E. saligna*." I have examined the trees for many years, latterly with Mr. R. H. Cambage, to settle this one point, *i.e.*, is there any character to separate the species? To carry out this work we chose (amongst other localities) the Brisbane Water (N.S.W.) district, which is the home of typical "Blue Gum" (*E. saligna*); and the Otford, Stanwell Park, district, in which typical *E. botryoides* is abundant.

We found *E. saligna* with *rough bark* up to the first fork and even higher up in shallow valleys facing the sea, *e.g.*, at Kincumber, Brisbane Water. From the Blue Gum flats (with good soil) in the neighbourhood, with their typical examples of the species, as we approach the sea and the innutritious sandy soil and strong sea breezes, we find that the rough bark gradually creeps up the butt, and the trees themselves become more crooked and even gnarled, finally merging into *E. botryoides*. The same thing was noticed in southern localities.

The following states the case in regard to typical specimens:—
"The differences between *E. saligna* and *E. botryoides* are habitually very great on account of their respective bark, thin, smooth and pale in the one; thick, rough and dark in the other;

* Useful Native Plants of Australia, p.435.

but the characteristics of the flowers and fruits are far less marked, being almost reduced in *E. botryoides* to a shorter and blunter lid, an usually more angular tube of the calyx and retracted, totally enclosed valves of the fruit" (Eucalyptographia, Mueller, under *E. saligna*).

In the same work, under *E. botryoides*, he says :—" When the tree has arisen on rich soil along running streams, its wood is regarded as one of the best among those of Eucalypts . . . [this is *E. saligna*, J.H.M.]; when the tree grows on the coast-sands, its wood is still useful for sawing and fencing, though the stems occur there often gnarled . . . [this is *E. botryoides*, J.H.M.]. *E. saligna* is in nature easily enough distinguished by the smoothness of its bark, which sheds in its outer layers successively; otherwise the differences are slight, consisting in the often somewhat longer lid and in fruits with half exerted valves."

E. saligna is the stately " Blue Gum " of rich soil flats, which yields the timber so well and so favourably known in New South Wales. Bark smooth, and with a little rough bark at the butt. *E. botryoides* is known as " Bangalay " or " Bastard Mahogany," and is a rough-barked (corky scaly) gnarled tree found in low-lying situations near the sea. *E. botryoides* has coarser fruits, with the valves not exerted; buds coarser, more squat; opercula more blunt. I see no difference in the seedling leaves or in the timber. Between the two types, as already defined, I find perfect connecting links; and the differences are, I am satisfied, entirely owing to soil and aspect.

Messrs. Baker and Smith distilled leaves of *E. saligna* from Lismore, N.S.W., and of *E. botryoides* from Milton, N.S.W., and found differences in the composition of the particular distillates obtained by them.* I would suggest that here we have an excellent opportunity, by making a series of distillations of leaves of *E. saligna* and *E. botryoides* to see whether any real difference between the trees can be ascertained that morphology fails to

* ' Research on the Eucalypts. '

show. I believe that, by testing, at the same season, the trees which morphologically show a complete transition between the two species, the oils would show a transition equally complete.

Holding the views that I do as to the identity of *E. saligna* and *E. botryoides*, I am obliged to combine them. I therefore propose to reduce *E. botryoides* to a variety of *E. saligna*. Both species were described by Smith in the same paper*, but, following the precedent that has been adopted by a number of botanists, *E. saligna* (p.285; *E. botryoides* is p.286) is the earlier name because it was described earlier in the paper.

New South Wales is the home of the types, both of *E. saligna* and *E. botryoides*. It will be convenient, as will be seen presently, to deal with *E. saligna-botryoides* in this order:—Queensland, New South Wales, Victoria.

Queensland.—Following are notes showing the additions Mr. F. M. Bailey has made in his 'Queensland Flora' to Bentham's 'Flora Australiensis.'

E. botryoides Sm. "A tall, handsome tree, with a rough, furrowed persistent bark *towards the base, white and smooth on the upper part of trunk and branches.*" Mr. Bailey only adds the words in my italics, which are a description of the bark of typical *saligna*.

He adds: "Brisbane; various southern localities, in mountain gullies and river flats (probably the largest tree of the Queensland species). Wood of a red colour, close in grain, hard, tough and durable; useful in large buildings, wheelwrights' work, and in all work where large beams of hardwood are required." This is an accurate description of *E. saligna*.

The only alleged Queensland locality given in the 'Flora Australiensis' ("Brisbane, Blue Gum, McArthur, No. 91, of Paris Exhibition Woods") is founded on an error, as will be explained later.

Coming to *E. saligna* Sm., Bentham in the 'Flora Australiensis' omits Queensland, but Bailey adds, "Forests in southern

* Trans. Linn. Soc. iii., 1797.

parts," and describes the timber: "Wood very tough and close-grained; very hard; of a grey colour," which is not a description of *saligna* timber.

In the 'Catal. of the Queensland Forestry Museum' (Forest Branch, Lands Department, 1904), we have:—

(a) "No.241. Grey Gum (*Eucalyptus saligna*): Plentiful; generally found on mountain slopes or in deep gullies on and near the coast of southern Queensland. Usually a very tall tree, with thick grey bark, and having longitudinal patches of a brownish colour. Wood red colour, close-grained, hard, and durable. Logs split rather freely at the ends on quarter. Used for general building purposes." This is undoubtedly *E. saligna*.

(b) "No.260. Flooded Gum (*Eucalyptus botryoides*): Plentiful in moist situations, on the borders of scrubs and mountain gullies along the coast of Southern Queensland. A very large tree, with a long smooth trunk of almost perfect cylindrical form, extending often 50 or 60 feet without a branch; bark deciduous, falling off in long narrow strips, often very white, and sometimes of a pale-green colour. Wood pink-brown; not so hard or heavy as many other Eucalypts. Splits on the quarter rather freely. Logs when cut about six months will almost float in sea water. Used for general building purposes, but will not last in the ground. Makes good flooring and weather-boards, joists and studs. Being comparatively light, it is suitable for punt-building." This is, doubtless, that form of *E. saligna* known in New South Wales as "Flooded Gum," and discussed by me at length in Agric. Gazette, N. S. Wales, and in the 'Forest Flora' of N. S. Wales (Part iv. p.75).

In the Report of Tests on "Blue Gum" from Queensland, experimented upon by the Victorian Timber Board, 1884, this timber is called *E. botryoides*—additional evidence of the confusion of nomenclature.

I have indubitable specimens of *E. saligna* from the following Queensland localities:—"3-mile Brush, Moreton Bay," and other Queensland localities (Leichhardt). Maroochie; Eumundi (F. M. Bailey). Brisbane (J. L. Boorman; J.H.M.).

Speaking of *E. botryoides*, Mueller ("Eucalyptographia") says: "Probably it does not extend into Queensland, as the Blue Gum-tree mentioned from thence is referable to a species of the series of *Leiophloia*, probably *E. saligna*." I have not seen *E. botryoides* from Queensland, but am far from saying that it will not be found in exposed south coast localities.

Following is the history of the Brisbane Water, N.S.W., specimens which have caused such confusion through the locality being mistaken for Brisbane, Queensland.

The following specimens are in Herb. Kew, where I examined them:—

(a) "No.91. Sydney woods," labelled "100-160 ft., Brisbane River* Gum, W. Macarthur, 1854" (for the Paris Exhibition, 1855).

(b) "No.18. Blue Gum." This specimen bears the further label, "Corresponding with wood collection in Museum Coll. by Macarthur and others, S. district, N. S. Wales, London Exhibition, '62."

Sir William Macarthur's catalogue ('Catal. of N.S.W., &c., Timbers at the Paris Exhibition, 1855') gives the following additional information—"Aboriginal name at Illawarra 'Couranga'; the Blue Gum of the Coast districts, particularly at Brisbane Water. Diameter 40-72 inches, height 100-160 ft. A magnificent timber for ship-building, and a favourite wood for house-carpentry; not nearly so hard or heavy, and not so durable as the Ironbarks."

Both these herbarium specimens are in bud only, and refer to the same samples, No.18 being the number of the same timber specimen (London Exhibition, 1862) which at the Paris Exhibition of 1855 bore the number 91.

They were labelled *E. botryoides* by Bentham and referred to in the 'Flora Australiensis' under that species.

* Brisbane Water is at the mouth of the Hawkesbury River, about 50 miles north of Sydney. The "Brisbane River" is, of course, in Queensland. The label is in Sir William Macarthur's handwriting, and is a slip of the pen for "Brisbane Water."

Following are some further New South Wales specimens also examined by Bentham. They were exhibited by Macarthur at the Paris Exhibitions of 1855 and London 1862.

“Nos. 42 (London), 94 (Paris) ‘Bangalay’ or ‘Swamp Mahogany’ of Brisbane Water. Diameter 30-36 inches. Height 40-80 feet. A crooked-growing tree, the timber much valued for knees and crooked timbers of coasting vessels.”

“No. 136. Sydney woods, Paris Exhibition, W. Macarthur, 1854.” Its number in the London Exhibition Catal. was 43. Sir William Macarthur called this “Swamp Mahogany” (a name now reserved, as far as possible, for *E. robusta*) and stated that the aboriginal name at the Illawarra is “Burram Murra.” His further note is:—“Diam. 36-60 inches, height 60-100 ft. A useful timber for inside work, but not equal to the better sorts of Eucalypti in strength or durability.” In bud and nearly ripe fruit. Specimen in Herb. Kew, where I saw it.

“No. 244. Sydney woods, Paris Exhibition, W. Macarthur, 1854, from Appin, 50-80 ft.” In the Exhibition Catalogue Sir William Macarthur gives the following additional information:—“Name in Cumberland and Camden ‘Grey Gum’ and ‘Maandowie’ (aboriginal). Diameter 24-48 inches, height 60-100 ft. An excellent gum timber.”

Bentham has marked this specimen *E. botryoides* (?). It is in bud only, is in Herb. Kew, where I examined it.

Macarthur calls this “Grey Gum,” a name never applied to *E. botryoides*, but sometimes applied to *E. saligna*.

New South Wales.—Both *E. saligna* and *E. botryoides* are common in the Sydney district. Southward from Milton, I have no specimens of *E. saligna* other than with a rough bark. These connect with the Victorian trees.

The following notes in regard to New South Wales trees will be suggestive. *E. saligna* is common on the northern tableland extending from the Hunter to New England. It is to be found at the foot of Mt. Lindsay, with rather small fruits and very exerted valves (W. Forsyth). I have it also from the Macpherson

Range, on both sides of the New South Wales-Queensland border (W. Dunn).

Local name "Woollybutt," aboriginal name "Mudione." Height 130 ft., diam. 2 ft. 6 in. Near Nelligen (J. S. Allan). As regards "Woollybutt," this is a name that as between *E. botryoides* and *E. saligna* could only be applied to the former, yet the herbarium specimens are typical *saligna*.

"Woolly Butt," South-west Milton. The fruits rather like those of *E. saligna* (R. H. Cambage). "Woolly Butt," Burrill, Milton. The fruits like those of *E. botryoides* (R. H. Cambage).

Going south, typical *saligna* may be found in the Bateman's Bay district, which is the southernmost locality known to me. At p.436 of my 'Useful Native Plants of Australia' is a note of a specimen (there referred to *E. botryoides*) which is very interesting. It is a "White or Scribbly Gum."

Going north, *E. botryoides* is common from Sydney to Newcastle. What the northern range is can only be ascertained by searching along the coast.

Victoria.—Mueller in his 'Key to the System of Victorian Plants,' excludes *E. saligna* as a Victorian plant. He, however, includes *E. botryoides*, "finally tall, bark persistent, dark, rough," and records it from the east (which includes Gippsland, but not alpine localities).

Dr. A. W. Howitt wrote some years ago to me:—"Gippsland Mahogany,' *Eucalyptus botryoides*. Locally it seems to be well thought of. It is confined to certain localities near the coast of East Gippsland, not extending in the mainland west of the mouth of the Mitchell River, but in the sandy tracts between the lakes and the sea at least as far as Seacombe. In this part, however, as also generally in the sandy coast-land, the timber is small. Timber of size for milling purposes grows, I think, only about the Snowy River."

The Victorian specimens in the National Herbarium, Sydney, all belong to *E. botryoides*.

Metung (A. W. Howitt). I may mention that juvenile leaves from this locality collected by Mr. Howitt precisely resemble those of typical *E. saligna* from Brisbane Water.

"Sea-coast at Lake King. Dr. F. Müller." (*E. botryoides* in Bentham's handwriting).

"Mahogany tree of Snowy River" (W. H. Harvey, ex Herb. Hook.).

E. Gippsland (E. E. Pescott through C. Walter).

2-3. *E. UMBRA* R. T. Baker; *E. RESINIFERA* Sm. var. *GRANDIFLORA* Benth.

Mr. R. H. Cambage and the writer found on the summit of First Point, near Kincumber, these forms as dense mallee-like scrubs, 5-6 feet high, fruiting freely.

4. *E. WILKINSONIANA* R. T. Baker.

This is a form of *E. Muelleriana* Howitt, showing transition to *E. eugenoides* Sieb. I promised (in Part i. of this Series; these Proceedings, 1904, p.760) to explain its position in this paper, but as I find that illustrations are very desirable for the purpose, I will deal with the matter in Part viii. of my 'Critical Revision of the genus *Eucalyptus*.'

5. *E. DREPANOPHYLLA* F.v.M.(?)

I have specimens from Woolooma Mountain, viâ Belltrees, Scone, November, 1903 (H. L. White) in fruit and half-ripe bud. No further particulars are available. They appear to come nearest to *E. drepanophylla*. The tree is less near, apparently, to *E. hemiphloia* F.v.M., but the foliage is different from that species. It is an interesting form, and I publish this note in the endeavour to trace *E. drepanophylla* for New South Wales (cf. Deane & Maiden, these Proceedings, 1901, p.342).

6. *E. JUGALIS* Naudin (see these Proceedings, 1903, p.897).

This appears to be a form of the very variable *E. melanophloia* F.v.M.

7. *E. VERNICOSA* Hook. f.

Mueller held the view, which he expressed to me verbally, that *E. vernicosa* is an extreme form of *E. Gunnii* Hook. f. At the same time it is such an extreme form that I think it seems desirable to retain it as a species. *E. Muelleri* T. B. Moore* appears to be a connecting link between *E. vernicosa* and *E. Gunnii*.

8. *E. GUNNII* Hook. f. var. *ACERVULA* Deane & Maiden.

I have specimens with fruits nearly twice the ordinary size. Glencoe near Mt. Gambier, South Australia (Walter Gill).

Since writing my paper† I have obtained specimens of *E. McClatchie* Kinney, from Prof. A. J. McClatchie, and they are identical with the above large-fruited form.

E. GUNNII var. *MACULOSA* Maiden.

I have Mr. Baker's *E. lactea*‡ before me as I write, and am familiar with the country from which most of the type-specimens were obtained. I cannot separate them from var. *maculosa*, and some of the specimens show transition to var. *acervula* (of which transition I have abundant evidence from other sources). Specimens such as these tend to prove the reasonableness of my view that it is undesirable to break up a polymorphic species like *E. Gunnii* into a number of species. The species varies exceedingly under varying conditions of climate and soil. It is, in my view, scientific to maintain the forms as varieties to show their intimate and branching relations with the "parent" species. The differences in oil constituents I assert are apparent, not real. When specimens of leaves are distilled from many forms and at different seasons of the year, then, I submit, it will be found that the oil results will exhibit curves and not steps as at present.

* Trans. Roy. Soc. Tas. 1886, p. 207.

† These Proceedings, 1903, p. 900.

‡ These Proceedings, xxv., 691.

E. GUNNII var. RUBIDA Maiden.

Called "Spotted Gum" at Dalgety, Snowy River (A. W. Howitt), a term more commonly applied to var. *maculosa*. Mr. Howitt's specimens of juvenile foliage are as narrow as those of var. *maculosa* ever are.

Around Wingello I have collected typical *rubida* and also specimens which show, both as regards fruits and juvenile foliage, transit between var. *rubida* and var. *maculosa*.

9. E. VIMINALIS Labill., and E. GUNNII Hook. f. var. RUBIDA.

Miquel,* speaking of *E. viminalis* Labill., gives *E. saccharifera* F. Müller, and *E. crucivalvis* F. Müller, as synonyms. I concur, having seen specimens of *E. saccharifera* and *E. crucivalvis* (the latter having very exserted valves).

Incidentally I may remark that *saccharifera* was sometimes written *sacchariflua*. Two specimens are before me as I write, viz., one in Miquel's handwriting, and a second in W. H. Harvey's handwriting "ex herb. Hook." circa 1855. We may therefore with safety put *saccharifera*, *sacchariflua* and *crucivalvis* as synonyms of *viminalis*.

Then Miquel (*loc. cit.*) describes a variety "*microcarpa* F. Müll., Ad Fifteen Miles Creek." I have seen an original specimen, and it bears the following label—" *Eucalyptus sacchariflua* Ferd. Müller var. *microcarpa* (?) Fifteen Miles Creek, Lofty Ranges [South Australia, J.H.M.], *E. viminalis* var. *microcarpa*." It is *E. Gunnii* var. *rubida*, to which we must add the above synonym.

There are, indeed, two Manna Gums, each worthy of the name *E. saccharifera*. *E. viminalis* is one, but the tree which in the highlands of the Southern Monaro, Northern Victoria, and also South Australia (to mention no other localities) which most profusely yields manna is undoubtedly *E. Gunnii* var. *rubida*.

10. E. TERETICORNIS Sm.

In my last paper (these Proceedings, 1904, p.773) I referred to this species. See also my 'Forest Flora of New South Wales,'

* Ned. Kruidk. Arch. iv. 125 (1856).